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Case Report

Parotid duct injury secondary to shark bite injury: Repair with a Crawford stent

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ABSTRACT

Introduction: Here we present a unique case of repair of a parotid injury caused by a shark attack. The repair technique is of interest due to the novel use of a Crawford stent, typically reserved for lacrimal duct injuries.
Case description: Our patient is a 43-year-old man who suffered a shark bite injury to the face and head ten days prior to surgery. The patient presented with multiple lacerations and a sialocele. During the surgery, a sialendoscope and open incision were used to find the duct laceration. The surgeon decided to utilize a Crawford stent as the stiff metal probe would satisfactorily delineate the structure and anatomy of Stenson's duct.
Discussion: Often, diagnosis of parotid gland trauma is missed at the time of injury, leading to later complications. In this procedure, we used a Crawford stent as its intrinsic stiffness allows it to tunnel through the duct easily.
Conclusion: Clinicians should have a high level of suspicion for parotid duct injury in a patient presenting with injury to the face, particularly with laceration type injuries. Our patient had a unique injury that required a novel Crawford stent repair over traditional silicone catheters.

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Introduction

Parotid gland trauma is rare, accounting for approximately 0.21% of all traumas.[1,5] This low rate explains the common missed diagnoses of parotid injuries.[1,3,7]

The most common etiology of parotid duct injuries is stab wounds.[3,5,6] Untreated parotid injuries lead to the formation of disabling sialoceles or fistulae.[1,3,7]

For proper diagnosis and treatment, anatomical knowledge of the parotid duct is necessary. The Van Sickel classification divides parotid duct injuries into: Site A (from the parotid gland to the posterior border of the masseter muscle), Site B (superficial to the masseter muscle), and Site C (distal to the anterior border of the masseter muscle). As site B is the most exposed area, it is the most susceptible to injury.[1]

The method of treatment for parotid duct injuries is based upon the age, site, and mechanism of injury. Commonly the surgeon will cannulate the duct and inject saline or methylene blue to locate the distal and proximal stumps, followed by microsurgical anastomosis.[3]

Around 50 shark attacks are reported worldwide per year. These attacks garner much media attention, but medical literature on treating them is limited.

A South African paper collected the medical treatment of 86 consecutive shark attacks between 1980 and 1999, making it one of the largest case series on treating shark attacks. It was concluded that while most injuries are minor (81%), the major injuries represent a threat to life and limb.[9]

Of nearly 6000 shark attacks reported on humans, there have been 52 attacks to the head and/or face. This number may be inappropriately low as some of the immediately fatal shark attacks may have had face and/or head wounds; however, shark attacks seem to have a predominance towards the extremities.[8]

Here we present a unique case of repair of a parotid injury caused by a shark attack. The repair technique is of interest due to the novel use of a Crawford stent, typically reserved for lacrimal duct injuries.

Case description

Our patient is a 43-year-old man who suffered a shark bite injury to the face and head ten days prior to surgery. On presentation, multiple facial lacerations at various stages of healing were noted. CT revealed evidence of multiple foreign bodies within the wounds and a sialocele of the left parotid gland. The patient had no significant medical comorbidities. The patient reported no functional deficits and all cranial nerves remained intact.

The initial procedure included exploration of the facial wounds and removal of foreign bodies. Image guidance showed three distinct foreign bodies consistent with shark tooth fragments. These foreign bodies were removed without incidence.

A sialendoscope was utilized to place a punctal dilator in the left punctum and sequentially dilate with 3, 4, and 5 lacrimal probe (Figures 1 and 2). Saline was used to evaluate the duct, which demonstrated presence of parotid tissue and severance of the duct proximally within the parotid gland. The remainder of the duct did not show any lacerations.

Next, an incision overlying the sialocele was made, and using a facial nerve monitor, dissection proceeded deep to the left parotid duct. Both the sialendoscope and open incision were used to find the duct laceration. The surgeon decided to utilize a Crawford stent as the stiff metal probe would satisfactorily delineate the structure and anatomy of Stenson's duct. Once the two ends of the duct were determined, the Crawford stent was placed intraorally through the incision in the face threading through the severed ends of the duct and then out through the preauricular tissues through a small stab incision. The duct was sewn over the stent, and the stent was then sutured to the skin in the preauricular area and in the mouth adjacent to the parotid duct orifice (Figures 1–3).

The patient was discharged on post-operative day one. The Crawford stent was left in place for ten days. There were no post-operative complications, and there was resolution of the sialocele.

Figure 1. A Crawford probe in the distal end of the parotid duct.

Figure 2. The Crawford Stent in the proximal and distal ducts.

Discussion

Diagnosis of parotid trauma is based on clinical presentation.[1] Often, diagnosis is missed at the time of injury, leading to later complications.

For best outcomes, repair of the duct should be performed within 24 h of injury. This prevents complications such as the formation of fistulas and sialoceles.[2,4] The surgeon should begin by examining the wound with gentle irrigation and debridement.[1] Next, the surgeon should verify the integrity of the gland and duct system by pressing the gland and looking for salivary excretion from the duct intraorally.[4] We suggest insertion of an active drain into the wound to prevent the accumulation of saliva, preventing postoperative complications.[4]

Our patient presented with a Van Sickel's Site C Injury.[2] Commonly, a small intravenous silicone catheter is inserted through the wound as a means of cannulation.[3,7] In this procedure, we used a Crawford stent rather than the commonly used silicone catheter. The Crawford stent was advantageous because the stiffness of the metal probe helped to separate and delineate the soft tissues surrounding

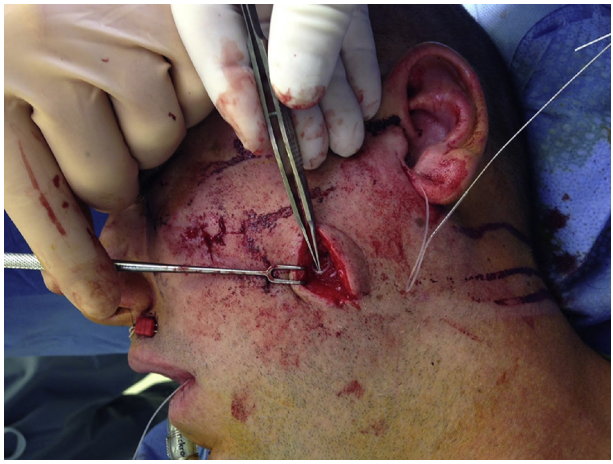

Figure 3. The fully threaded Crawford stent.

the duct injury. We believe in this particular case, a silicone catheter would have had insufficient intrinsic stiffness to tunnel through the duct.

To locate the distal end of the duct, cannulation is performed via its intraoral salivary orifice with a lacrimal probe or small catheter. Once the distal stump has been identified, the proximal stump can be located by approximating the wound and following the direction of the probe exiting the distal stump.[3,7] Injection of saline or methylene blue through the cannulated duct can aid in confirming the presence of duct laceration. This method can also be used to identify the proximal end of the parotid duct. In jagged wounds involving tissue avulsion, the proximal end can be identified by milking the parotid gland and looking for flow of saliva into the wound.[1–4] Saliva is secreted by the distal end of the parotid duct, and saline or dye should therefore exit at this location. If there is leakage of saline or dye, the duct is lacerated, and the site of laceration must be identified immediately.[1,4] If no fluid is seen in the wound following saline injection, the duct has remained intact, and the catheter must be left in place for one week while external pressure is applied for 48 h.[2,4]

After both ductal stumps have been identified, the catheter should be sutured to the buccal mucosa and left in place for two weeks to prevent stenosis and allow proper salivary flow; however, some suggest the stent can be removed once the parotid duct is repaired.[1–3]

Conclusion

Literature on the management of shark bite injuries is limited. Here, we have described the first reported case of a parotid duct injury due to shark bite. Early identification of parotid injury is important to prevent complications such as sialoceles or fistulae. Clinicians should have a high level of suspicion for parotid duct injury in a patient presenting with injury to the face, particularly with laceration type injuries. Our patient had a unique injury that required a novel Crawford stent repair over traditional silicone catheters. This case report highlights how an expanded surgeon toolkit may be used to manage challenging Stenson's duct injuries.

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Further reading

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